**SCIENCE & CURIOSITY**

1. What is the difference between a scientific worldview and scientism?
2. What is the difference between falsifiable and verifiable claims?
3. Do you believe in objective truth?
4. Do you think science and religion are compatible?

|  |
| --- |
| **School tests harm science education**  1\_\_\_\_\_\_\_\_\_ing schoolchildren take tests is harming students’ 2\_\_\_\_\_\_\_\_\_ in science, as well as having a negative 3\_\_\_\_\_\_\_\_\_\_ on kids’ natural curiosity. This is the conclusion of a British university report into science teaching and testing in primary schools. Researchers from Durham University 4\_\_\_\_\_\_\_\_ed that too many schools were teaching science just so students could pass tests. There is a lot of 5\_\_\_\_\_\_\_\_\_\_ for students to get to better schools. The experts said there was very little real science teaching going on that 6\_\_\_\_\_\_\_\_\_\_d students to find out things for themselves. Learning by doing, experimenting and seeing should be at the 7\_\_\_\_\_\_\_\_ of all physics, chemistry and biology lessons. The Durham University team found the opposite; that there was little hands-on, practical work taking place in Britain’s schools.  Lead researcher Professor Peter Tymms said it was important to 8\_\_\_\_\_\_\_\_ new approaches to primary school science. He compared today’s teaching with that of the past sixty years and found that testing was harming children’s natural 9\_\_\_\_\_\_\_ to ask questions about science: “We suspect that the current national 10\_\_\_\_\_\_\_\_\_\_ to science in primary schools is not 11\_\_\_\_\_\_\_\_ing children’s scientific thought and curiosity as much as is possible,” he said. Professor Tymms made it 12\_\_\_\_\_\_\_\_ what schools and science teachers need to focus on, saying: “The 13\_\_\_\_\_\_\_\_\_\_ of science in primary schools should be to 14\_\_\_\_\_\_\_\_\_ a sense of curiosity and positive attitudes in the young child. It should also 15\_\_\_\_\_\_\_\_\_ the child in solving problems to 16\_\_\_\_\_\_\_\_ with the physical, natural and human worlds.” |

(source: www.breakingnewsenglish.com)

|  |  |  |  |
| --- | --- | --- | --- |
| encourage | do | heart | purpose |
| make | guide | impact | interest |
| foster | develop | desire | approach |
| warn | affect | pressure | *clear* |

**DISCUSSION**

1. How does the way sciences were taught at your school compare with science teaching at university?
2. What experiments or science demonstrations do you remember from your studies?
3. Have you ever been to a science museum where you can touch and do various things to see science in action?

**CURIOSITY:** Were you very curious as a child? Were you or are you now interested in these areas? How do you develop your interest? What's the last thing you've learned?

**chemistry | mechanics | the animal world | the Universe | the world and other countries | God and the supernatural | politics | economy | the human body | psychology | history | music theory**

**Quotes about science**

1. *Should we force science down the throats of those that have no taste for it? Is it our duty to drag them kicking and screaming into the 21st century ? I am afraid that it is. (*George Porter, a British chemist*)*
2. *With fame I become more and more stupid, which of course is a very common phenomenon.* (Albert Einstein)
3. *There is a theory which states that if ever anyone discovers exactly what the Universe is for and why it is here, it will instantly disappear and be replaced by something even more bizarre and inexplicable. There is another theory which states that this has already happened."* (Douglas Adams, author of *The Hitchhiker's Guide to the Galaxy*)
4. *An expert is one who knows more and more about less and less. (*N.M. Butler, President of Columbia University*)*
5. *Statistics is like a bikini. What they reveal is suggestive. What they conceal is vital.* (Arthur Koestler, author and journalist)
6. *A major obstacle to science is not ignorance but knowledge.* (Craigh Loehle)
7. *Science is a way of trying not to fool ourselves.* (R. P. Feynman, American physicist)

**CREATIVITY IN SCIENCE**

|  |
| --- |
| Most people can learn to be far more creative than they are. Our school system emphasizes single correct answers and provides few opportunities for exploratory learning, problem solving, or innovation. Suddenly, when one becomes a graduate student, however, it is expected that one is automatically an independent thinker and a creative problem solver.  **Barriers to navigation**  In the early fifteenth century, Prince Henry the Navigator of Portugal set out to explore Africa and open it to Portuguese trade. Portuguese expeditions began to work their way down the western coast, always within sight of land. Upon reaching Cape Bojador in Western Sahara (known as the Cape of Fear), the Portuguese sailors would inevitably turn back, convinced that this was the end of land and that no ship would ever pass it. Prince Henry sent out 15 expeditions between 1424 and 1434 until finally one succeeded by sailing a few miles out to sea and going south for a few miles. As a navigation feat, this manoeuvre was trivial. The barrier was not a physical one but a mental one. Many barriers are of this type. An item becomes fixed in the mental landscape, **immutable**. What lies beyond the barrier becomes not merely unknown, but unimaginable. Major enhancements in creativity can be achieved by developing the courage to recognize and overcome mental barriers, just as the Portuguese sailors did.  **Don't be an expert.**  All graduate students are taught that it is essential to become an expert. As a short-term goal it is, of course, valid. Academic search committees are also looking for experts. As a lifestyle, however, becoming an expert can **inhibit** creativity. Why is this? After all, it seems that an expert has more tools at their d………….l for solving problems. The problem revolves around our **mental constructs**. In learning a subject, we create a network of facts, assumptions, and models. Once we think we understand something, it is linked up to an explanation and supporting ideas. This construct may not be true, but it comes to seem real. As one becomes more of an expert, a larger and more complex network of facts and explanations accumulates, making it difficult to consider radical alternative ideas or to r………….e new problems. The expert is in danger of developing the small cage habit. Zoo animals, when moved to a larger cage, may continue to **pace about** an area the size and shape of their old smaller cage. **An** Aristotle or Freud may create a set of bars within which most people pace rigidly, never noticing clues from outside the cage. The danger in becoming an expert is that one tends to build one's own cage out of the certainties and facts which one gradually comes to know. Dogmatism builds cages in which the dogmatic then live and expect every-one else to live also. (...) |

Craig Loehle, A guide to increased creativity in research - inspiration or perspiration?, ***BioScience***, Vol. 40, No. 2 (Feb., 1990), pp. 123-129

**Comprehension**

1. Which aspect of traditional teaching suppresses creativity?
2. What does the example of Prince Henry the Navigator of Portugal illustrate?
3. What’s the danger of being an expert?

**TASK**: Make a definition of science out of these words: “Science is ...”

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| rational  never-ending  unique  ***tested*** | ***evidence-based***  ***natural***  full | ***process***  ***phenomena***  ***explanations***  range | OBSERVE  OCCUR  PRODUCE  (the form of **these verbs** can be changed) | of  of  we  around | us  that  for  and |